THE OSPR NEWS

California Office of Spill Prevention and Response

Fall 2004 Issue 2 Vol. 11

Highlights

Pipeline spill damages largest contiguous tidal marsh in the United States

by Dana Michaels, Information Officer

US EPA photo

Sorbent materials in Suisun Marsh, near Cordelia

A 14-inch pipeline owned by Kinder Morgan Energy Partners, L.P. (Kinder Morgan), burst on April 27 in one of the most important wetland areas in California: Suisun Marsh, northeast of San Francisco Bay. The pipeline, which carries gasoline, diesel and jet fuel from San Francisco Bay area refineries to Sacramento, Chico, and Reno, spilled at least 104,000 gallons of diesel fuel. The exact amount of diesel released is still under investigation.

Kinder Morgan representatives say their computerized control system detected an "operational upset condition" and shut down the pipeline around 6:30 P.M. on April 27. Land crews and an aerial patrol were dispatched, but were unable to locate the problem. At 11:00 A.M., April 28, they informed the State Fire Marshal of plans to pressure-test sections of the pipeline to confirm its integrity. A leak was discovered as a result of the pressure test, and the release location was confirmed by aerial overflight at approximately 2:00 P.M. Kinder Morgan dispatched crews to begin containment and cleanup, then notified the California Office of Emergency Services (OES) at 2:27 P.M.

OSPR's first response team, from the nearby Fairfield office, arrived within half an hour of notification. That team included Fish and Game wardens Savannah Morgan and Greg Horne, oil spill prevention specialist Vince Jeffries, and environmental scientists Carl Jochums and David Price.

OSPR contacted Suisun Resource Conservation District (SRCD) Executive Director Stephen Chappell, who quickly closed all water control structures at the site, to keep the diesel from spreading to tidal sloughs that lead to Grizzly and Suisun Bays, Carquinez Strait and San Francisco Bay.

Chappell's knowledge of the 84,000-acre Suisun Marsh and local water control systems enabled responders to contain the majority of the oil within a 240-acre managed wetland area owned by the Drake Sprig Duck Club. Maps and aerial photos of the marsh, provided by the duck club's owners, were invaluable during the response.

Kinder Morgan Energy Partners photo

Dead or injured wildlife were hard to see in the thick vegetation.

The U.S. Coast Guard responded and established a Unified Command with OSPR and Kinder Morgan. A command post was established in the parking lot of the nearby Suisun Pheasant Club. Kinder Morgan contracted with Marine Spill Response Corporation (MSRC) for cleanup. Shortly before nightfall on April 28, MSRC began deploying boom and pads to contain and absorb the diesel.

The Kinder Morgan/Suisun Marsh spill attracted tremendous interest from the news media, after the spill was inaccurately characterized by one news service as "a massive spill of as much as one million gallons." By noon, April 29, there were at least a dozen TV satellite trucks and over 20 reporters at the command post. Within a day, the story was news around the world.

Federal, State, and local agencies also responded with staff and resources. The U.S. Coast Guard's Pacific Strike Team provided a mobile command post and experienced spill responders. OES sent their mobile command post and staff to assist. The Regional Water Quality Control Board, Solano County Department of Environmental Management, and SRCD were among those responding to the spill.

The US Fish and Wildlife Service (USFWS) and OSPR initiated natural resource damage assessment and are still evaluating natural resource injuries.

California's Oiled Wildlife Care Network – a partnership between OSPR and the University of California, Davis Wildlife Health Center – was activated, and staff prepared for an onslaught of oiled animals.

Unfortunately, the goldeneye, Virginia rail, two mallards, the beaver, and two of the teal ducklings died in captivity.

Wildlife search and collection teams also brought 22 oiled, dead birds – including teals, mallards, semi-palmated plovers and western sandpipers – 17 dead mammals (muskrats, mice and moles), and a dead gopher snake to the Center. One of the mice was an endangered salt marsh harvest mouse. The DNA of eight other dead mice is being analyzed to determine their species.

Two adult ducks (mallard and bufflehead) and five teal ducklings were treated, cleaned, banded, and released at a Vacaville area lagoon.

DFG-OSPR photo by Cindy Kanemoto

OSPR spill responders confer outside the command post (L-R): OSPS Al Storm, ES Carl Jochums, Lt. Rob Roberts (SOSC), and Warden Scott Murtha.

The Unified Command deployed OSPR's wildlife hazing expert from UC Davis to set up a variety of visual and noise disturbance equipment to discourage additional wildlife from entering the contaminated sections of the marsh. This equipment included simple reflective tapes on poles, propane-powered cannons, and various pyrotechnic noise makers. Hazing is designed to minimize the number of animals injured by a spill, and OSPR biologists believe more animals would have been oiled, had there been no hazing efforts.

Thirteen oiled birds, a beaver, and several mice were captured alive and taken to the San Francisco Bay Oiled Wildlife Care and Education Center in Cordelia – just two miles from the spill. Among the birds were a bufflehead, a goldeneye, three mallards, seven teal, and a Virginia rail.

The USFWS issued an incidental take permit, which allowed their staff to trap and relocate a number of animals – including salt marsh harvest mice – in order to save them from the diesel contamination. Kinder Morgan created a salt marsh harvest mouse conservation plan, in consultation with USFWS, to provide the best achievable protection for endangered species populations.

Other wildlife were probably contaminated and left the area to die elsewhere. Biologists have found that at most oil spills, wildlife search and collection teams only locate and identify a small percentage of the affected organisms. In addition to birds and mammals, species known to have been affected by the Kinder Morgan/

See Suisun spill, page 4

Suisun spill, from page 3

Suisun spill include fishes, reptiles, mollusks, benthic (mud-dwelling) invertebrates, and marsh vegetation.

The State Fire Marshal and federal Office of Pipeline Safety oversaw the removal and replacement of the damaged pipeline section and pressure tests of the new 48-foot section. The Concord-to-Sacramento pipeline resumed normal operations on Sunday afternoon, May 2. The rupture in the pipe was approximately 18 inches long and four inches wide at the widest point. Tests by an independent laboratory indicate that this section of pipe was badly corroded. The entire run of the pipeline was scheduled to be taken out of operation in fall 2004, and has since been replaced.

State Lands Commission photo

Ruptured section of pipeline

State Lands Commission photo

Pipeline repair crew matches new section of pipe to existing line.

Once the on-water clean-up operations were complete, attention was focused on the diesel-soaked soil and peat. On May 28, the Coast Guard transferred Federal On-Scene Coordinator authority to the U.S. Environmental Protection Agency (EPA).

The EPA and OSPR supervised the excavation, removal, and bioremediation of Suisun Marsh. Some of the techniques being used are called landfarming. The Unified Command evaluated several cleanup alternatives and decided that bioremediation was highly feasible and cost effective. This involved adding fertilizer and water to affected soils to facilitate biodegradation of diesel in the soil, and tilling to aerate.

OSPR's investigation of the case is ongoing at press time, as is a natural resource damage assessment. The incident is also being investigated by the Coast Guard, Solano County District Attorney, and the Regional Water Quality Control Board.

Area of Suisun Slough oiled by pipeline spill

OSPR photo by Janna Herren; map features by OSPR GIS Team

Two terrific appointments

by Dana Michaels

OSPR photo by Dana Michaels

DFG Director Ryan Broddrick with OSPR Administrator Carl Moore, in Sacramento.

Governor Arnold Schwarzenegger has made two excellent appointments that greatly affect OSPR. The first was L. Ryan Broddrick, appointed Dept. of Fish and Game Director on Jan. 20, 2004. Broddrick is a longtime member of the DFG family who left in 2001 to be director of conservation policy for Ducks Unlimited. His DFG career in the enforcement ranks – including two years as OSPR's regional patrol chief – led him all the way to become Chief Deputy Director in 1997. Prior to joining DFG, he was an environmental scientist for both the State and private industry.

On June 28, the governor appointed Carl D. Moore OSPR Administrator. Moore had been our Interim Administrator since February 28, 2003. Members of the OSPR staff are very happy to have a longtime member of our team at the helm. (See Inside OSPR, page 20.)

Prestigious appointment for OSPR scientist

The National Research Council has appointed OSPR Environmental Scientist Yvonne Addassi to the Committee on Understanding Oil Spill Dispersants: Efficacy and Effects.

Following the initial meeting of the committee in March, the members determined that additional expertise in the area of real-time policy concerns regarding dispersant use was needed. They added an individual with trustee agency experience who can address the information needs and real-time concerns of decision-makers regarding the use of dispersants.

Ms. Addassi earned her Master of Science in Ecology and emphasis in Environmental Policy from the University of California, Davis in 1997. Her primary responsibilities at OSPR include program coordination for the statewide licensing, approval and use of oil spill cleanup agents, as well as the use of applied response technologies (ART) such as *in-situ* (in-place) burning and dispersants.

Yvonne facilitates primary research and policy development for preparing and updating the legislative report on the feasibility of requiring alternative oil spill clean-up technologies and serves as State liaison for ARTs in such professional groups as the Pacific States-British Columbia Oil Spill Task Force and EPA Region IX Regional Response Team. She is also responsible for the development and implementation of State policies for the use of in-situ burning and dispersants, and coordination of three dispersant area subcommittees utilizing net environmental analysis as a means of trade-off quantification.

Ms. Addassi has published several papers on in-situ burning and Net Environmental Benefit Analysis (NEBA), including: Utilizing Net Environmental Benefit Analysis, the Use of In-Situ Burning as a Mechanism to Minimize Environmental Impacts of a Marine Oil Spill, and Case Study: SS JACOB LUCKENBACH: Adaptation of Traditional Incident Command Structure to Meet the Unique Needs of Long-Term Wildlife Operations. She serves as an advisory board member for California's Oiled Wildlife Care Network (OWCN) and also serves on the board of directors for the California Association of Professional Scientists (CAPS).

Yvonne's appointment was approved by National Academy of Sciences (NAS) President Bruce Alberts, and posted for public comment in the NAS' current projects database. To search for the study website, visit the National Academies Internet homepage at www.nationalacademies.org, click on "Current Projects," and type "Oil Spill Dispersants: Efficacy and Effects" (the name of the committee).

Water: Life's Key Ingredient for Fish and Wildlife

by John Turner, Hal Thomas, Ryan Todd, & Eugene Toffoli

Mark Twain is credited with saying, "whiskey's for drinkin' and water's for fightin' over." Nowhere is this truer than in California where, historically, water has been in short supply, and competition over its use has been fierce. Ample quantities of high quality water have been, and continue to be, absolutely essential to maintaining California's economy, environment, and way of life.

In 1897, the California Supreme Court decided a major water pollution case brought by the State to protect the Truckee River from fish kills caused by sawdust and mill waste discharges. The case, *People v. Truckee Lumber* (116 Cal. 397), clarified the public ownership of fish and wildlife resources and re-stated the State's right and power to protect its interest in fish and wildlife. This right and power is generally known as the public trust doctrine.

The Department of Fish and Game (DFG) is the trustee for California's fish and wildlife resources (Fish & Game Code §711.7). Although the historical record of name changes and governmental reorganizations has occasionally obscured the Department's achievements, public trust obligations continue to be the primary role and function for DFG. The Department is responsible for protecting and maintaining the survival, health, abundance, diversity, and utilization of California's wildlife and plants. The Department's pollution programs are geared toward preventing and responding to spills and restoring and mitigating impacts to wildlife and their habitats when they are affected by pollution events.

California passed the first anti-water pollution law, in response to sawmill pollution that killed numerous fish in the Truckee River.

DFG archive photo

No other California agency has this legislative mandate or awesome responsibility. Hence, the Department has placed major emphasis on ensuring both adequate quantities and high quality water to maintain healthy aquatic environments.

History

The State's involvement in pollution and water quality dates back to 1872 when Penal Code §635 was enacted. This section was the genesis for today's water pollution statute, Fish and Game Code Section 5650. The early pollution laws were designed to address a variety of threats to fish, including illegal fishing methods using poisons from plants (*Indicus cocculus*) or explosives, and mortality caused by factory and mill waste discharges.

In the late 1800s, wildlife issues were handled by the Board of Fish Commissioners. The early law was enforced by Fish and Game Wardens. These Wardens were variously funded either from state or local government. In 1909, the Board was renamed to the more familiar Fish and Game Commission. In 1926, the Commission created a pollution bureau, and in 1927, the Division of Fish and Game was created separate from the Commission. This entity became the Department of Fish and Game in 1951.

During the entire first half of the twentieth century,

THE OSPR NEWS

The OSPR NEWS is published by the California Department of Fish and Game Office of Spill Prevention and Response, to provide information regarding OSPR programs and activities. For a free subscription, e-mail dmichael@ospr.dfg.ca.gov; phone 916-445-9338; or write:

Dana Michaels, Editor
The OSPR NEWS
California Department of Fish and Game
PO Box 944209; Sacramento, CA 94244-2090

Cover Photo by U.S. EPA:
Spill responders at the Kinder Morgan/Suisun Marsh diesel spill, including OSPR environmental scientist Jim Hardwick.

Nineteenth century Fish and Game employees had to use pack mules to get to mountain lakes

DFG archive photo

DFG, in its various forms, maintained its role as the State's only pollution control agency. Then, in 1949, the legislature passed the Dickey Act, which created the Regional Water Quality Control Boards. Further changes were legislated in 1970, with passage of the Porter-Cologne Act, which created the State and Regional Water Board system that exists today.

The legal relationship between the Regional Water Boards and the Department was clarified in both a 1957 enactment (Fish & Game Code §5651) and the 1968 case *People v. Union Oil Company* (268 Cal.App.2d 566). The Appellate Court reaffirmed that DFG's water quality and pollution responsibilities had not been pre-empted or negated by the statutory program that created the Regional Water Quality Control Boards. The Court held that a spiller was still responsible for ensuring that discharges were not deleterious to wildlife, even if the discharger had a permit from a Water Board to discharge pollutants. In 1996, a further attempt to modify the legal relationship between the Regional Water Boards and the Department met with limited success, when passage of SB 649 (Costa) clouded the Department's jurisdictional authority to issue a citation to a discharger with a waste discharge permit or a waiver issued by a Regional Water Board. In February 2003, legislation was introduced to once again amend Section 5650 by reversing this provision of the 1996 amendments. (see SB 923 [Sher].)

As a result of this long-term legal relationship, DFG staff has for many years worked closely with the staff of the various Water Boards to maintain a uniform and consistent approach to the enforcement of water quality. As directed by Fish & Game Code Section 5651, the Department and the Regional Water Boards have the responsibility to coordinate the cleanup of continuing and chronic pollution situations. By the mid-1960s, the Regional Boards and DFG were working so well together that they had formed a partnership and were sharing the costs of operating water quality laboratory facilities. Neither the Department nor the Regional Boards could individually afford such labs, but they were of immense value to both agencies. This cooperative working relationship has continued essentially undiminished, at the working staff level. However, the concept of partnering and sharing the responsibility for funding these programs of mutual interest has become much more difficult, due to increased administrative complications.

During the 1970s, the Legislature brought greater conformity to emergency response activities within the State of California by focusing on emergency planning, leading to a revision of the state Oil Spill Contingency

See Water, page 8

DFG archive photo

Oiled common murre at Santa Barbara, 1923

Water, from page 3

Plan and the creation of the Hazardous Materials Incident Contingency Plan. Both documents assigned local governments and their emergency response units as the lead for hazardous material incidents within their jurisdiction, unless relieved by State representatives. The Department was assigned with ensuring that off-highway spills are cleaned-up to a level that would protect wildlife and habitat. Back-up response in rural counties is a primary duty of DFG, as local emergency training and staff are sometimes insufficient to respond to many public health threats posed by spills.

In the 1980s, several vessel incidents provided a stimulus for new programs and State authority, e.g., the *Puerto Rican* in 1984 in the San Francisco Bay Area, the *Apex Houston* in 1986 off the central coast, the *PacBaroness* in 1987 in the Santa Barbara Channel, the *Exxon Valdez* in 1989 in Alaska, and the *American Trader* in 1990 off Huntington Beach. In 1990 the Lempert-Keene-Seastrand Oil Spill Prevention and Response Act was enacted (see Gov. C. §8670.1 *et seq.*), and the Office of Spill Prevention and Response (OSPR) opened its doors in 1991. The new statute created an independent Administrator, who is a Chief Deputy Director of DFG, and is appointed by and serves at the direction of the Governor. The Administrator is responsible for all prevention and response aspects of marine oil spills. The marine oil spill program is supported by a special funding source to ensure that trained personnel are always available to respond to such spills.

DFG-OSPR photo

Fire and toxic spill caused by train derailment at Cajon Pass, 1994 (above)

DFG-OSPR photo

Sorbent boom on the East Walker River, 2001

Today, the pollution and water quality programs of the Department — along with the associated analytical laboratories, legal, economic, and investigative expertise required to operate a sound pollution enforcement program — are consolidated within OSPR. There, they work in close coordination with each other, with regional field units, and with local District Attorney and City Attorney Offices throughout the state to quickly and effectively respond to spill and pollution events.

San Francisco Harbor Safety Committee member wins Legacy Award

by Al Storm and Dana Michaels

The Pacific States/British Columbia Oil Spill Task Force gave its 2004 Legacy Awards for Oil Spill Prevention, Preparedness, and Response at its Annual Meeting on July 20. This year's Legacy Award winners include Ms. Joan Lundstrom, a member of both the San Francisco Bay Region Harbor Safety Committee (HSC) and OSPR Technical Advisory Committee. She is also Vice-Mayor of Larkspur, California.

Legacy Awards are given to industry, non-profit or public agency organizations and individuals, or for team efforts. Candidates are nominated for projects, accomplishments, or leadership that demonstrates innovation, management commitment, and improvements in oil spill prevention, preparedness or response that result in enhanced environmental protection. Efforts to promote partnerships and involve the public are favored. Organizations, individuals, or projects nominated for the Legacy Award must be located or primarily operating in the Task Force jurisdictions of California, Oregon, Washington, British Columbia, Alaska and/or Hawaii. Organizations or individuals representing a regulated industry must demonstrate a satisfactory history of compliance with state, provincial, and federal oil spill regulations.

Jean Cameron, Executive Coordinator for the Pacific States/British Columbia Oil Spill Task Force, characterizes these Legacy Award winners as "…models for others in industry, government, and the public to emulate. We are pleased to honor the commitment of this year's winners to effective oil spill prevention, efficient spill response, and collaborative teamwork."

Joan Lundstrom received a Legacy Award in recognition of her contributions to navigational safety – and thus spill prevention – in the San Francisco Bay area. Joan was a charter staff member of the Bay Conservation and Development Commission's (BCDC) oil spill prevention program and later represented BCDC on the San Francisco Bay Region HSC. She served as vice-chair for 4 years and was recently appointed Chair of the HSC.

On the HSC, she prepared an analysis of the economic impacts of the SF Bay tug escort regulations prior to their promulgation, chaired the Tug Escort Workgroup, chaired the Underwater Rocks Removal Workgroup, chaired the Physical Oceanographic Real-Time System (PORTS) Ad-Hoc Advisory Workgroup, was one of three members who wrote the initial Harbor Safety Plan (HSP), chaired the HSP Annual Update Workgroup, and co-chaired the HSC Bylaws Workgroup. In addition, Joan regularly attended meetings of the State Board of Pilot Commissioners, and was appointed to their Regulations Subcommittee as a public member.

Joan continues to serve as a BCDC Commissioner. Both as a BCDC Commissioner and as Mayor of the City of Larkspur, Joan was a champion of government transparency, full disclosure, due process, partnership-building, and facilitating the highest level of public participation. (She continues to do that, as Vice Mayor.) Scott Merritt of the Foss Maritime Company and former Vice Chair of the HSC noted, "Joan exhibits everything that's right about government. She makes the system work by extracting a high level of performance from participants. Her leadership makes everyone be the best they can be. Through Joan's efforts, the San Francisco Bay experiences a higher level of maritime safety, which prevents pollution and makes the Bay Area a safer, healthier, and better place in which to live, work, and enjoy recreation."

Other 2004 Legacy Award winners are: The Alaska Tanker Company, LLC; U.S. Coast Guard Marine Safety Office, Group Portland; Trans-Alaska Pipeline System Shipping Companies; ConocoPhillips Marine/Polar Tankers, Inc; SeaRiver Maritime, Inc.; Tesoro Maritime/Seabulk Tankers; and the Alaska Tanker Company, LLC.

• •

The Pacific States/British Columbia Oil Spill Task Force is celebrating 15 years of serving as a forum for coordination and collaboration on oil spill prevention and response policies that protect over 56,660 miles of coastline from the Beaufort Sea to the Baja Peninsula and the island chain of Hawaii.

Task Force Members are the directors of the oil spill prevention and response agencies in Hawaii, California, Oregon, Washington, British Columbia, and Alaska. For further information, please contact Jean Cameron, Oil Spill Task Force Executive Coordinator, at (503) 392-5860 (phone) or JeanRCameron@oregoncoast.com (email).

Preparing for the worst: California SONS 2004

by Dana Michaels

The incident status board provides access to the latest information to all responders in a command post.

OSPR photo by Kim McCleneghan

People familiar with OSPR know that we perform oil spill response exercises (drills) with other government agencies and the oil industry. Drills are required by both the state Oil Spill Prevention and Response Act and federal Oil Pollution Act of 1990. They are, in essence, rehearsals for the real thing.

Through drills, we get to know our counterparts from industry and other government agencies; walk through the response processes; test contingency plans, new systems or software; and find our weaknesses. Shortcomings discovered in a drill can be corrected before we have a real emergency.

The largest, most challenging exercise is one the U.S. Coast Guard - Dept. of Homeland Security directs every few years: the Spill of National Significance (SONS) exercise. As the name implies, the scenario for SONS is a massive incident that will overwhelm all local response resources and force the involvement of high-level officials and executives. This drill ran in real-time for three days, 24-hours a day, with over 2,300 participants.

California SONS 2004 was sponsored by the Coast Guard, California OSPR and the American Petroleum Institute SONS Consortium. ChevronTexaco and ConocoPhillips played the roles of the responsible parties in this, the largest oil spill exercise in U.S. history.

For the first time, the Government of Mexico was integrated into the response management organization, and – because the scenario included oil flowing into Mexican waters – they ran a field command post in Ensenada, Baja California.

The Coast Guard SONS exercise program is designed to increase the preparedness of the entire response organization, from port level responders to agency heads in Washington, D.C. Three major objectives are to:

1. Increase national preparedness for a SONS by engaging all levels of spill management in a coordinated response;
2. Improve, through practice, the ability of the National Incident Command (NIC) organization to manage a SONS incident; and
3. Maintain awareness of agency heads and law makers in Washington, DC, of their roles during a SONS response.

The California SONS drill was held April 20-22, 2004 in southern California and included field, regional, and national components. All were connected by a scenario in

OSPR photo by Dana Michaels

OSPR Environmental Scientists Corey Kong and Carl Jochums work with industry responders in the Planning Secton.

which two major (vessel) oil spills occurred within a few hours of each other, just outside the ports of Los Angeles-Long Beach and San Diego.

The field-level exercise tested the Area Contingency Plans for these ports. The NIC-level part of the exercise tested the Regional Contingency Plan and the ability of the NIC to effectively manage a SONS and support both the local field responders and national interests.

The national-level exercise brought together senior federal agency officials and industry representatives to discuss inter-agency issues and responsibilities. It tested the National Contingency Plan and USCG policies. The exercise design ensured NIC-level issues surfaced, were discussed, and were acted upon by the staff of government agencies and industry that would be involved in a SONS.

OSPR photo by Debra Hamilton

A Clean Coastal Waters response vessel deploys boom and a skimmer, for the SONS exercise.

Nearly every OSPR employee and several other Fish and Game staff participated in the SONS drill, either at one of the three command posts or in the field, the Sacramento operations support center, the laboratories, or wildlife care centers. Wildlife operations were not part of the official drill scenario, so California's Oiled Wildlife Care Network held their own simultaneous drills at the Los Angeles Oiled Bird Care Center in San Pedro and at the SeaWorld San Diego Oiled Wildlife Care Center.

OSPR photo by Dana Michaels

OSPR, Coast Guard, and industry spill responders worked together in the Los Angeles command post.

Three days of exercise were followed by debriefing sessions in which participants discussed the things that went well, things that need improvement, and the lessons learned from the experience. The latter is a primary reason for doing response exercises. It is impossible to know which plans work as well in practice as they do on paper until they're actually used. Discovering any elements that don't work well in a drill gives us time to devise better methods and procedures, before we're in the crisis environment of a real oil spill.

The California SONS was a first test for the Initial National Response Plan and National Incident Management System, the first to integrate an international component, and the first to include a consortium of oil companies in the planning and execution of a SONS exercise.

The Coast Guard defines an effective exercise as one that achieves its stated objectives and serves as a realistic platform from which participants can practice their skills and gain greater experience. The California SONS 2004 exercise was highly successful by both measures, because of the performance of the exercise planners and participants.

The Coast Guard's California SONS 2004 After Action Report is available on the Internet at: https://38.232.74.112/CAL_SONS_04.nsf/ It presents the major issues that have NRS implications and is intended to drive improvements to the national prevention, preparedness, and response systems. The report does not contain regional, local, or agency-specific issues or recommendations. The next SONS exercise will take place in 2007.

Using Geographic Information Systems in oil spill prevention and response

By OSPR GIS Team: Judd Muskat, Research Program Specialist I (GIS), Mark Lampinen, Research Analyst II (GIS), and Randy Imai, Staff Environmental Scientist

Abstract

Geographic Information System (GIS) support has become a basic tool for oil spill response in California because of its inherent data management, analysis, and display capabilities. Presented here are sample GIS maps from the *SS Jacob Luckenbach* oil spill response.

The California Department of Fish and Game Office of Spill Prevention and Response (OSPR) and the U.S. Coast Guard worked jointly to identify the source of a mystery oil spill that began in November, 2001. The investigation determined that the *S.S. Jacob Luckenbach,* which sank on July 14, 1953, was the source. This vessel is also directly responsible for mystery oil spills that have been impacting the native marine wildlife and the California coastline since 1992. The shipwreck now rests in 176 feet of water, 17 miles southwest of the Golden Gate Bridge. Salvage operations during the summer of 2002 were focused on removing the remaining oil still onboard.

Introduction

In November 2001, oiled seabirds were observed and collected along the central California coast from the mouth of Point Reyes in the north to the Monterey Peninsula in the south (Figure 1). No oil spill had been reported, so this incident was named the San Mateo Mystery Spill. Mystery or orphan oil spills with no identifiable source or responsible party have repeatedly occurred off the central California coast injuring several thousand birds in the past decade alone. These winter mystery spills have traditionally been attributed to clandestine deck washing, illegal bilge pumping or tank cleaning by vessels far off-shore.

As directed in the area plan, OSPR and the Coast Guard Marine Safety Office - San Francisco (MSO-SF) utilized the Incident Command System to establish a Unified Command for response to the incident. As seabirds continued to get oiled, well into 2002, the Unified Command organized a multi-agency Oil Source Identification Task Force to find the source of the mystery oil.

The task force was comprised of scientists and other staff from OSPR, MSO-SF, the State Lands Commission, National Oceanic and Atmospheric Administration (NOAA), California's Oiled Wildlife Care Network (OWCN), Gulf of the Farallones National Marine Sanctuary (GFNMS), U.S. Fish and Wildlife Service, the oil industry, and private consultants – all working at the direction of the Planning Section within the Unified Command. This task force utilized extensive oil chemistry analysis from hundreds of samples; examined tanker and shipping traffic and schedules; utilized trajectory analysis (including hind-casting of the stranded oil and oiled birds) and remote sensing imagery, and interpretations; and investigated several historical shipwreck databases. GIS was the vehicle for managing, analyzing, displaying, and communicating the data.

Chemical analysis of the oil had ruled out a natural seep as the source. OSPR chemists also confirmed that the oil was not Alaska North Slope Crude, which is commonly transported through California waters. Ultimately, the investigation revealed that the oil was leaking from the wreck of the cargo vessel *SS Jacob Luckenbach.* This freighter sank in a collision in 1953, 17 miles southwest of the Golden Gate, while outbound and fully-loaded with military supplies. Analyses of oil fingerprints also confirmed that the oil leaking from the *Luckenbach* was identical to the oiled-feather samples taken from birds during the winter mystery spills in 2001, 1997-1999, and 1992-1993.

Figure 1 **(right) shows where both live and dead oiled seabirds were found. When the animals are collected, specific information, including a GPS coordinate (latitude and longitude) or a descriptive location is recorded in the field. The seabird stranding distribution information is one variable used to direct the field collection teams.**

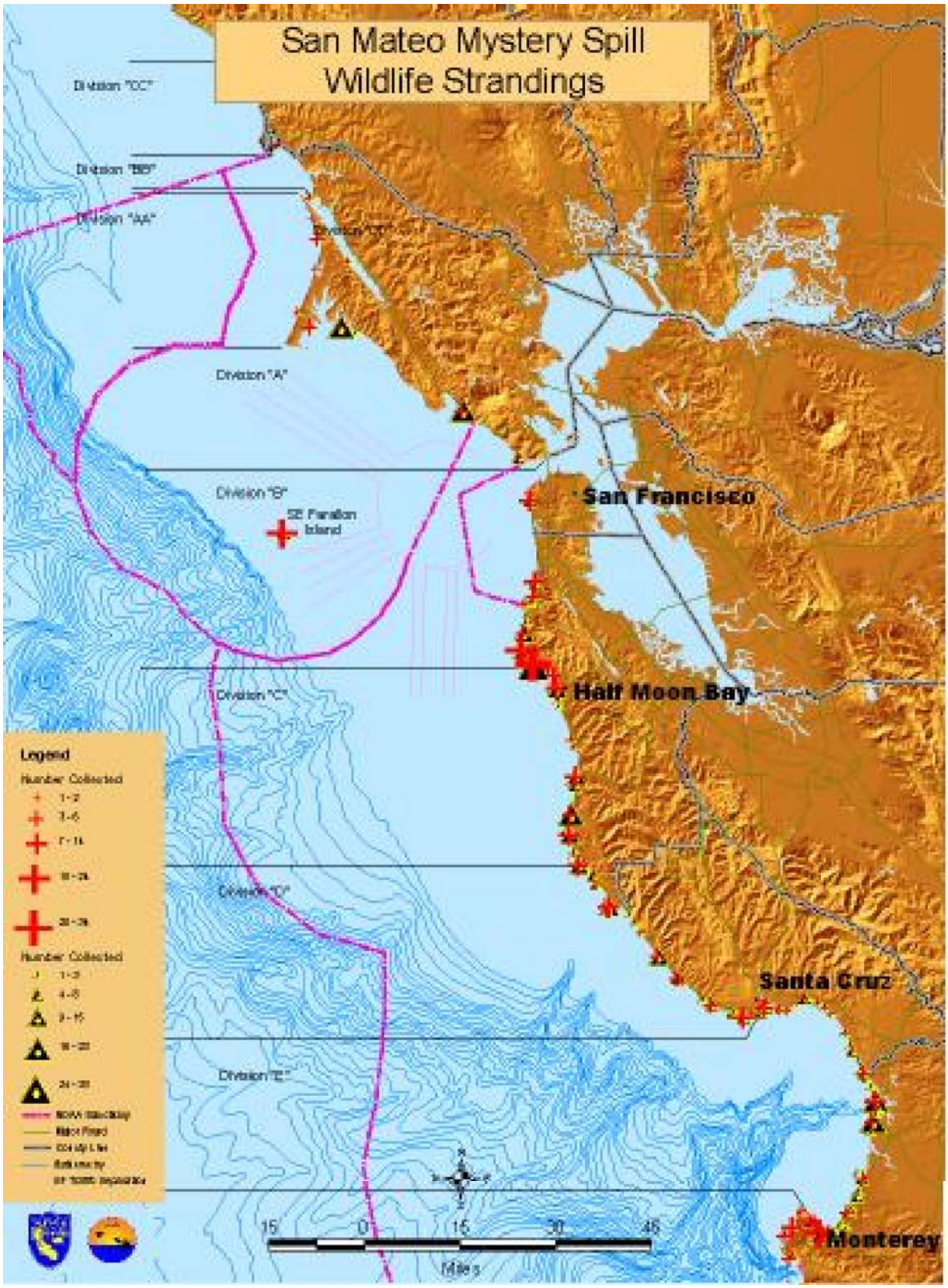


Figure 1. This map depicts the distribution and numbers of live and dead oiled wildlife that were collected early into the San Mateo Mystery Spill response.

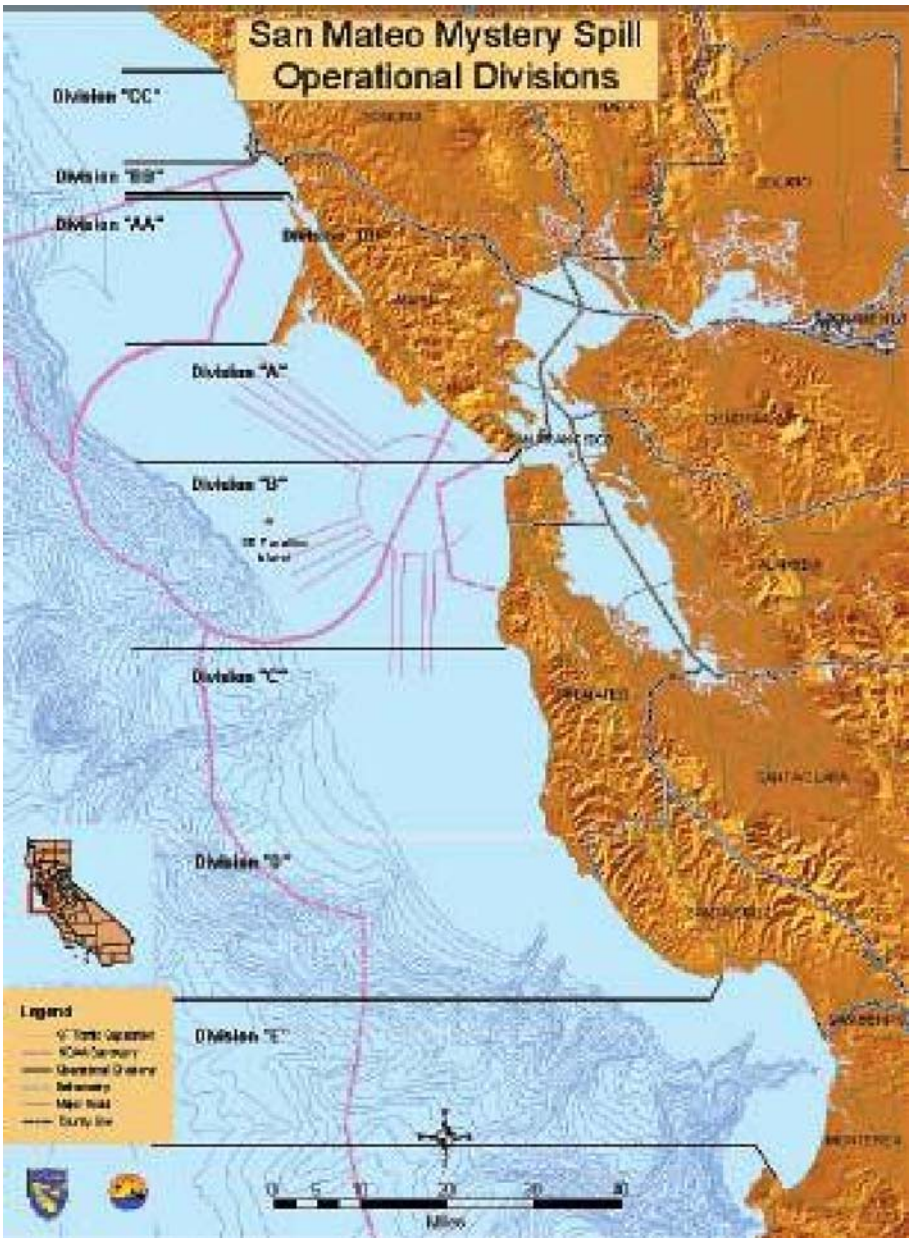
See GIS, page 14

GIS, from page 13

GIS Maps

A Geographic Information System allows one to overlay different sets of information about a specific geographic area. It is both a database and map generation system with specific capabilities for data analysis and visualization.

GIS technology was used in this spill response as follows: OSPR purchased five archival satellite radar images that were acquired over the target area and incorporated into the GIS database. One image from December 13, 2001, shows features that resemble oil slicks, southeast of the Farallon Islands. An historical database of shipwrecks provided by the State Lands Commission was imported into the GIS and used to help focus on likely source targets. GIS was used to generate operational division base maps that were used for wildlife search and rescue operations. The locations of both live and dead oiled wildlife strandings were mapped using the GIS. The locations of sensitive biological resources at risk were brought into the GIS database using data derived from weekly Global Positioning System (GPS)-based aerial overflights of the affected area. Ocean current patterns that were generated from satellite imagery interpretations were incorporated into the GIS database to help direct wildlife search and collection teams in the event of a release caused by the oil removal operations. The following six example maps were used during the response as a means to visualize the large amounts of data that were generated in both the search for the source of the mystery oil and during the oil removal project after the *Luckenbach* was determined to be the source of the oil.



Operational Divisions

As the spill response escalated, the affected coastline was segmented into operational divisions. Placement of the division lines is based on coastal features and landforms or cultural features. These division lines were used to guide the wildlife search and collection teams as well as beach cleanup crews (Figure 2).

Figure 2. Extent of the impacted area. Operational divisions are generated based on coastal geomorphology or geopolitical criteria. These divisions are used to guide wildlife search and collection teams as well as cleanup operations. The spill area spans three NOAA National Marine Sanctuaries and six California counties along almost 200 miles of coastline.

Historical Shipwreck Database

Tabular databases of historical shipwrecks from the State Lands Commission and the Gulf of the Farallones National Marine Sanctuary were imported into the GIS using the associated coordinate data (Figure 3). These data were examined and analyzed to create a short list of wrecks most likely to have been the source of the "mystery oil." Starting with some 1500 records, the process of elimination identified four potential vessels. Table 1 provides a listing of the four candidate wrecks.

Vessel	Location	Depth	Cargo	Comments
T/V Puerto Rican (chemical tanker)	37.51 deg latitude 123.01 deg long. 11.5 nautical miles (21km) S of SE Farallon Island	1,500 feet (457 meters)	Variety of chemicals including lubrication oils	Exploded; aft-third sank in 1984, causing a large oil spill. Significant cargo still onboard.
USS Independence (decommissioned aircraft carrier)	37.47 deg. latitude 123.13 deg. longitude 14.5 nautical miles (27km) SW of SE Farallon Island	3,200 feet (975 meters)	Unknown	Sunk as a target in 1951. Contaminated by radiation at Bikini Island.
US Navy YTB Oilers (two)	37.72 deg. latitude 122.97 deg. longitude 2 nautical miles (3.7km) E of SE Farallon Island	200-600 feet (60-180 meters)	Unknown	Little is known about these two vessels
USS Jacob Luckenbach (freighter)	37.67 deg. latitude 122.79 deg. longitude 10 nautical miles (18.5km) E of SE Farallon Island	200 feet (60 meters)	Military hardware and supplies bound for Korea	Sunk in the fog in 1953 after a collision with the *SS Hawaiian Pilot*

Figure 3. Several historical shipwreck databases were imported into the GIS. After much investigation and analysis, four potential wrecks were identified as the most likely sources of the mystery oil. The wreck of the *SS Jacob Luckenbach* was the first to be explored because it was located at the most shallow depth of the four targets.

Satellite Radar Imagery

The OSPR Administrator approved the purchase and analysis of satellite radar images of the spill area. The intent was to search for ocean surface oil slicks between Point Reyes, Monterey, and Southeast Farallon Island to help determine the source of the mystery spill. Dr. Jan Svejkovsky (Ocean Imaging, Solana Beach, CA) was contracted by OSPR to obtain and analyze any available satellite radar imagery for the November–December, 2001 time frame.

Five satellite radar data sets were selected because of their area of coverage and a suitable sea state at their time of acquisition as indicated by the National Oceanographic Data Center Buoys in the suspected spill area. DFG and USCG reconnaissance overflights had reported occasional observations of oil slicks in the region. Those that were observed were several meters wide and up to 1,000 meters long. Given the spatial resolution of the satellite radar images at approximately 30 meters, the odds of detecting an oil slick on the radar images were small. However, on one image from 12/13/01 a number of small, possibly petroleum-caused slick features were present in the vicinity of Southeast Farallon Island (Figure 4).

See GIS, page 16

GIS, from page 15

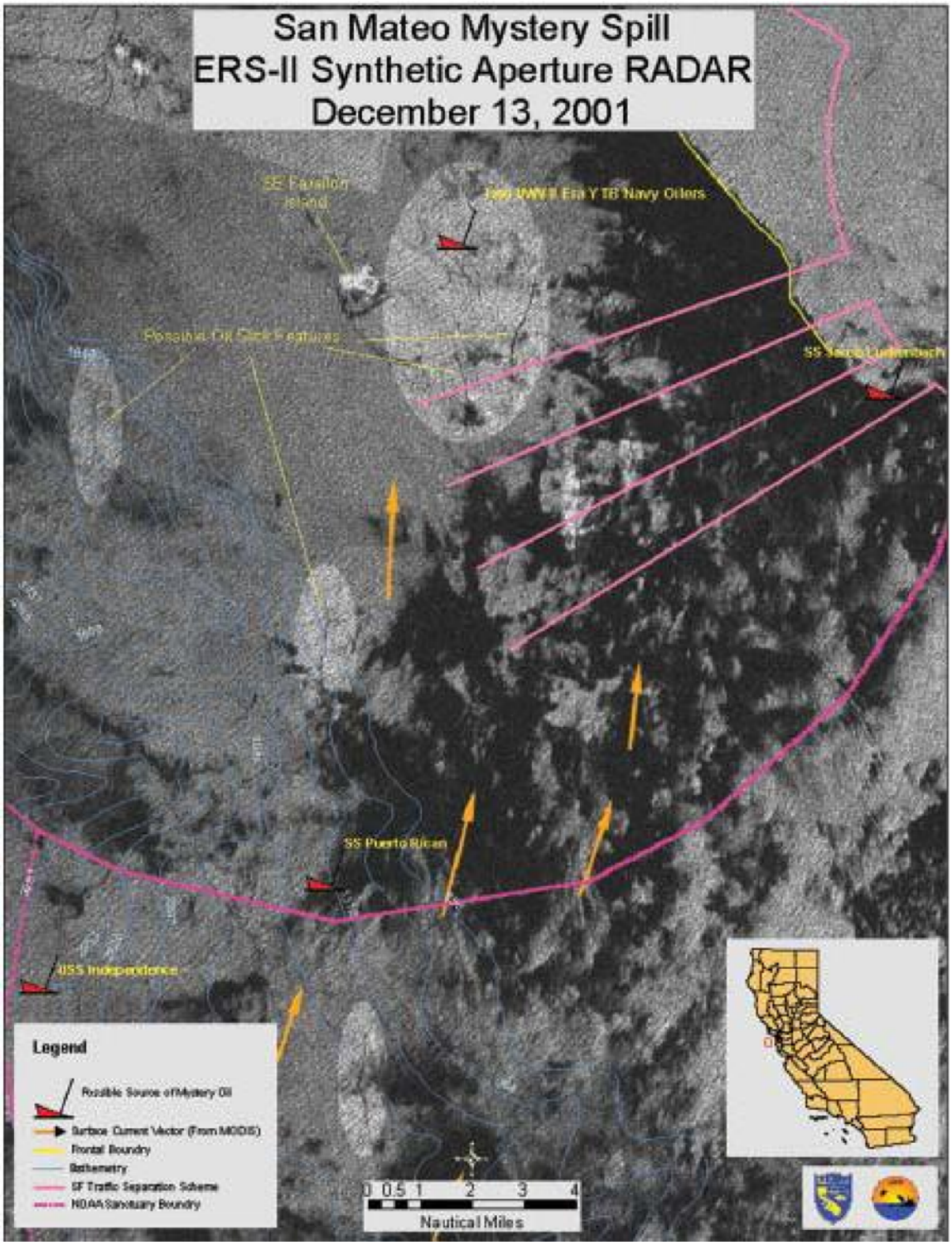


Figure 4. Synthetic Aperture Radar image from the ESA's ERS-II Satellite from the incident area on 12/13/01. Areas of low backscatter appear darker. The locations of the four target vessels are shown. Oil slick features are highlighted. Regional surface current vectors and frontal boundaries show features related to water masses observed in the 12/13/01 MODIS image.

Resources At Risk

Throughout the response, marine and coastal aerial reconnaissance was conducted by R.G. Ford Consulting to document biological resources at risk. Over-flights were conducted at least weekly (weather permitting), along the coast and transecting the ocean over the region of interest. On-board GPS receivers captured the flight path as well as individual wildlife observations. After each flight the data were transmitted to OSPR headquarters in Sacramento, entered into the GIS. Maps were generated and sent to the Unified Command staff (Figure 5).

Figure 5. Aerial pelagic and coastal surveys for biological resources at risk from the oil were conducted by R.G. Ford Consulting, at regular intervals (weather permitting) throughout the duration of the spill response and salvage operations. All observations are shown here. Species of special concern are highlighted on the map.

See GIS, page 18

GIS from page 17

Regional Surface Currents

Throughout the duration of the response and the ensuing *Luckenbach* oil removal operations, Ocean Imaging used satellite-derived remote sensing imagery to compute surface current flow patterns for the affected region (Figure 6). Surface current vectors were derived by tracking small (1-5km) features, recognizable in pairs of images separated by intervals of 6-15 hours, and 24-hour intervals, when available.

These ocean current data were entered into the GIS, and maps of regional surface current flow patterns were transmitted electronically to the Unified Command staff. The information was used to identify potential locations of oil impact.

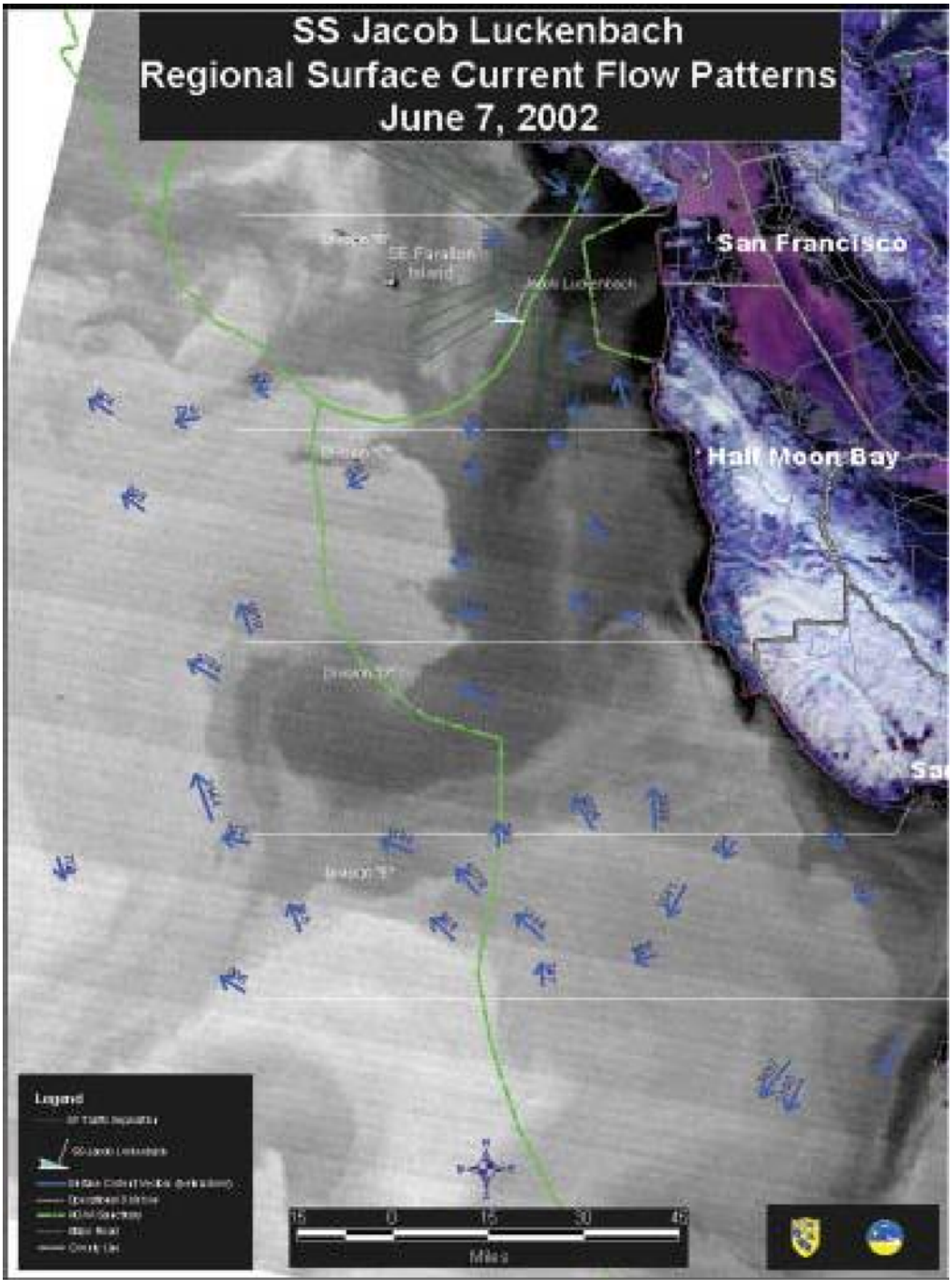


Figure 6. GIS map showing regional surface current flow patterns and other geopolitical information, displayed over a background image from the MODIS sensor on NOAA's Terra satellite. When a sufficiently cloud-free pair of images with acceptable viewing geometry was obtained over time intervals of 6-12 hours, small thermal and/or turbidity features were tracked within the pair and the displacement was used to compute the velocity vectors and direction.

MODIS data download, image processing and surface current vector interpretation by Ocean Imaging

Conclusion

Geographic Information System (GIS) support has become a basic data management tool for oil spill response. During an oil spill emergency, large amounts of data are generated and utilized, much with a geospatial component. The inherent ability to import and display convergent data layers provides the incident command team a powerful decision-making tool.

There are still several potential threats in the immediate area that have not yet been evaluated for leaking oil. Just one mile south of the southern boundary of the Monterey Bay National Marine Sanctuary, several miles off shore from Cambria, lies the fully loaded oil tanker *Montebello,* sunk by a torpedo in 1941. GIS will be an essential tool of the OSPR responders when (*not if*) this vessel begins to disintegrate.

References

McCleneghan, K., (2002). Ghost of the SS Jacob Luckenbach. In: *Oil Spill Intelligence Report*, New York, NY. Vol. XXV, No. 50: 1-4.

McGrath, G.G., J.A. Tarpley, H.A. Parker-Hall, and A. Nack.. (2003). The Investigation to Identify the SS Jacob Luckenbach – Using Technology to Locate a Hidden Source Of Oil that Caused Years of Impacts and the Future Implications of Sunken Shipwrecks. In: *Proceedings of the 2003 International Oil Spill Conference,* National Petroleum Institute, Washington, D.C.

Muskat, J., M. Lampinen, R. Imai, (2003). GIS as a Tool for Oil Spill Response: Example Maps from the SS Jacob Luckenbach Oil Spill Incident. In: *Proceedings of the 2003 ASPRS Annual Conference, American Society for Photogrammetry & Remote Sensing*, Bethesda, Maryland 20814-2160

Ocean Imaging. (2001). Analysis of Multi-Sensor Satellite Imagery of San Mateo Mystery Spill N300/F1060. Report to the California Department of Fish and Game Office of Spill Prevention and Response. Ocean Imaging Corporation, Solana Beach, California.

3/4 of OSPR's GIS team: Judd Muskat, Joanne Sanders, and Randy Imai. Not available for photo: Mark Lampinen.

OSPR photo by Dana Michaels

OSPR's Luckenbach Investigation on Television

OSPR's Luckenbach spill investigation of 2001-2002 has been featured on three major television programs, recently.

California Connected, a one-hour news magazine broadcast on all California public television stations, did a 15-minute segment that aired in May 2003 and July 2004.

Extreme Evidence, a half-hour program about unusual investigations, dedicated one episode to the Luckenbach. COURT TV has shown it at least twice in 2004.

The HISTORY CHANNEL's *Deep Sea Detectives* produced a one-hour program on the Luckenbach story, which first aired August 30, 2004.

While *California Connected* is only shown in California, the COURT TV and HISTORY CHANNEL shows are viewed internationally via cable and satellite providers. If you missed them, watch your listings for the re-runs!

According to the UK P&I Club's Karl Lumbers, human error costs the maritime industry some $541 million each year, and represents a major problem for insurers. The UK Club is undertaking an analysis of the causes behind human error, which accounts for 54% of liability claims. The UK Club has paid $1.6 billion over the past 15 years on claims caused by human error. (Source: Lloyd's List)

Inside OSPR

Promotions

Carl Moore, Administrator

On June 28, 2004, Governor Schwarzenegger made our "Interim Administrator" the REAL THING! Carl Moore, an OSPR attorney since 1991 (when he wasn't Acting Deputy Administrator or Acting Director of Boating & Waterways), has been our Interim Administrator since February 28, 2003. He is exceptionally well-qualified to oversee OSPR, with particular expertise in federal legal issues, admiralty and international law.

During his years with OSPR, Carl has been responsible for coordinating legislation affecting ships in California waters, and is familiar with regulations promulgated by the Coast Guard and the International Maritime Organization affecting shipping. He has been responsible for implementation of State regulations affecting tanker safety and routing, tank vessel inspection, and tug assistance requirements, among others. He also prepared the report to the California Legislature for the Coast Guard Vessel Traffic System program in our state.

In addition, Moore has previously served as interim Deputy Administrator, Special Legal Counsel to the Administrator, and supervisor of OSPR's Regulations unit. DFG loaned him to the Department of Boating and Waterways, where he was interim Director from 1998 to 2001.

Carl earned his Bachelor of Arts degree in political science at the University of California, Santa Barbara, and completed post-doctorate studies in admiralty at the University of Pacific's McGeorge School of Law. He served 33 years in the Coast Guard Reserve, attaining the rank of Rear Admiral. In 1986, he was appointed by then-Department of Transportation Secretary Elizabeth Dole to be Vice Chair of the Coast Guard Navigation and Safety Advisory Council. This appointment requires State Senate confirmation.

Paul Hamilton, Fish and Game Captain

Paul Hamilton, who was Lieutenant of OSPR's southern enforcement squad for three years, is now Captain of the Inland Spill Prevention and Response program. Reporting to Assistant Chief Lisa Curtis, he replaces Captain Rod Simon, who retired last fall.

Paul, a Fish and Game Warden for seven years, has been with OSPR since 1998. While supervising the OSPR wardens in San Diego, Orange and Los Angeles Counties, he sought to improve their training opportunities and response capabilities, and increase the enforcement of anti-pollution laws at hazardous materials incidents that threaten or affect California's natural resources.

He earned his Bachelor of Arts degree in history and natural resource management from San Diego State University. After graduation, he was a teacher and football coach, then spent six years as a biological consultant in private industry. On the personal side, Paul's wife is a teacher, and they have two children. They have just moved from San Diego and are adjusting to life in Sacramento.

Honors

OSPR Scientists Michael Sowby and Yvonne Addassi have received a Meritorious Public Service Award from the Department of Homeland Security, US Coast Guard. The award is in recognition of their contributions as California's representatives to the Region IX Regional Response Team's Applied Response Technologies Subcommittee. They were specifically honored for their expertise on the use of dispersants, which helped the subcommittee receive pre-approval for the use of dispersants in Federal waters. This pre approval was an unprecedented step forward in Region's IX oil spill response preparedness. Mike and Yvonne (pictured below) continue OSPR's tradition of being the best of the best.

Arrivals

Christian Corbo

Fish and Game Warden Christian Corbo transferred from DFG's South Coast Region (Redondo Beach) to OSPR's Long Beach position on July 1, 2004. A 1999 graduate of California State University Fullerton, he holds a Bachelor of Science degree in biology, with emphases on marine sciences and botany.

Prior to joining the Dept. of Fish and Game, Christian was employed as a seasonal supervisor for the Laguna Beach Lifeguard Department. As a lifeguard, he was involved with the dive team, cliff rescue team, and was a deckhand aboard their rescue vessel. In this position, he received a prestigious Medal of Valor from the United States Lifesaving Association for his actions during the Laguna Beach mudslides of 1998.

At DFG, Christian has become involved in the dive team, swift-water rescue technician courses, and is currently a defensive tactics instructor. In his free time, Christian enjoys spending time with his family, teaching his young daughter how to swim, and learning the art of spear fishing.

Inside OSPR, from page 21

James Foto, Oil Spill Prevention Specialist

James Foto joined OSPR's Marine Safety Branch field staff on May 1, 2004. Based in the Los Alamitos office, he came from the Marine Facilities Inspection Division of the State Lands Commission, where he worked as a marine terminal safety inspector. Prior to that, he served as a response member of the USCG Pacific Strike Team. He has been learning OSPR's protocols with Oil Spill Prevention Specialists (OSPS) Dennis Chastain, Ed Boyes, Jack Prescott and Verne Josey.

James is a committed Coast Guard reservist, attached to the newly-formed Marine Safety and Security Team 911-03 in San Pedro, where he participates in Port Security and Homeland Defense missions. Those duties include enforcement of Safety and Security zones set by the Captain of The Port (COTP) and armed law enforcement boardings in support of Coast Guard missions.

Frank Gray, Environmental Scientist

Frank Gray joined OSPR's Base Realignment and Closure Program in December, 2003. He works with the military, various state and federal agencies and consultants to assess and remediate the ecological risks of chemical contamination at military sites.

Frank has been with the Department of Fish and Game for 23 years, most recently in the Sacramento Valley and Central Sierra Region. During his tenure there, he was responsible for California Environmental Quality Act (CEQA), General Plan, and other project review for four counties. He also planned and monitored various habitat restoration projects in the Sacramento-San Joaquin Delta. In his eight years in the Central Coast Region, he worked as a fisheries unit biologist and was active in the review of water rights, stream surveys, county land use planning, and other issues.

Frank earned a Bachelor of Science degree in fisheries biology from Humboldt State University. After high school, he served as an aircraft handling director in the U.S. Navy and, later, on a search and rescue crew in the Coast Guard Reserve. He enjoys birding, hiking and playing tennis, and says he really likes being part of the OSPR team.

Coming soon!

OSPR's New Mobile Command Post

OSPR has been given the green light to develop bid specifications for Fiscal Year 2005/06 to purchase a new mobile command post (similar to the example pictured above) for responding to spill incidents statewide.

Cara Roderick, Oil Spill Prevention Specialist

A new OSPS in the Marine Safety Branch, Cara Roderick reviews contingency plans and works on Harbor Safety Committee issues. She came to OSPR from the Governor's Office of Emergency Services (OES) Hazardous Materials Unit, where she was a scientist working on an accidental release prevention/chemical risk management program for facilities and counter-terrorism, among other subjects. Previously, Cara assisted in a pesticide air monitoring and toxic air contaminant program for the State Air Resources Board.

This is not Cara's first job with the Dept. of Fish and Game. After graduating from the University of California, Davis with a Bachelor of Science degree in environmental toxicology, she worked as a scientific aide in DFG's Pesticide Investigation Unit and Aquatic Toxicology Laboratory.

Cara's free time is spent assisting with her home building project, enjoying the outdoors, and keeping up with her 4-year old son.

Dennis Ryan, Environmental Scientist

A Staff Environmental Scientist in OSPR's Resource Assessment Program, Dennis Ryan has joined our team of scientists and resource economists who conduct Natural Resource Damage Assessments (NRDA) and oversee environmental restoration projects following oil spills. Dennis works cooperatively with DFG's federal, state and local counterparts, other stakeholders, and the public. Together, they identify and implement projects that will restore, rehabilitate, replace, or acquire the equivalent of the natural resources injured as a result of a spill.

Dennis holds an MBA from Golden Gate University and a Bachelor of Science degree in environmental toxicology at UC Davis. He is a Certified Hazardous Materials Manager/Registered Environmental Assessor, with 24 years of experience in environmental, health, safety, and fire protection.

Before joining OSPR, Ryan was a hazardous substances scientist with Cal EPA's Department of Toxic Substances Control (DTSC) and a staff environmental scientist in the State Fire Marshal's Unified Hazardous Materials and Hazardous Waste Management Regulatory Program. During those six years, he conducted Certified Unified Program Agency (CUPA) evaluations, developed policy, and provided stakeholder guidance.

Prior to State service, Dennis worked as a plant administrator at UNOCAL Chemicals, where he managed facility environmental health and safety programs, contract administration, and community relations. At Versar Environmental Risk Management, he was a project manager conducting environmental investigations, compliance audits, and contaminated site clean-ups. He has also been an environmental specialist with the National Sanitation Foundation, where he was responsible for testing, inspections, certification, and training pursuant to consensus standards for products, equipment, commercial operations, and processes that could affect environmental and public health.

Bill Scott, Oil Spill Prevention Specialist

William (Bill) P. Scott joined OSPR on August 2, as an Oil Spill Prevention Specialist working from the Los Alamitos field office. Bill was at the top of the OSPS exam list and transferred from the State Lands Commission's Marine Facilities Division, where he worked as a Marine Safety Specialist I.

Before entering State service, Bill worked in the petroleum industry for Defense Fuels Support Point, Powerine Oil Company, Dow Chemical, West Coast Shipping, and Western Offshore Drilling & Exploration. He has an extensive and diverse skill set developed in the domestic and international petroleum transportation and exploration industries. Bill is a US Navy veteran who served two Western Pacific tours that included Vietnam.

Jeff Westervelt, Industrial Hygienist

Jeff came to OSPR from the California Conservation Corps, where he served as the Department health and safety officer, industrial hygienist, and workplace violence prevention officer. Along with a myriad of other duties, he conducted 24-hr HAZWOPER* training for approximately 500 corpsmembers and staff, each year.

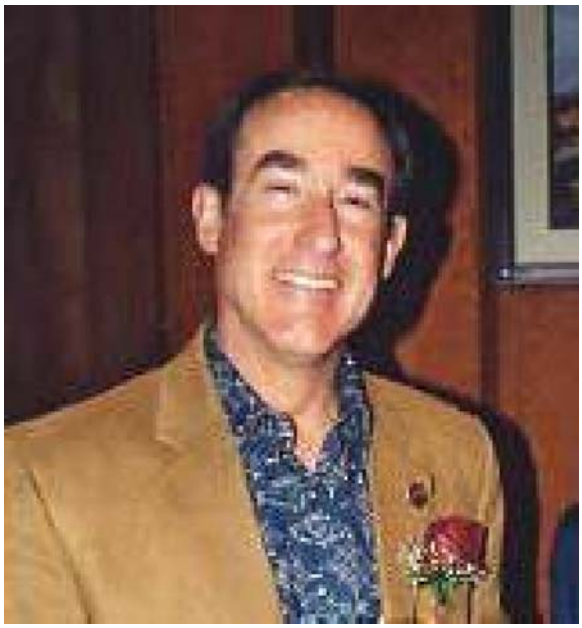
Previously, Jeff was an industrial hygienist for private consulting firms. There, he performed air monitoring, bulk sample collection, noise surveys, employee training, safety inspections, compliance program audits, ergonomic evaluations, and indoor air quality assessments.

A California Specialized Training Institute (CSTI) outreach instructor since 1998, Jeff is certified to teach courses in HAZWOPER, hazardous materials First Responder – Operations level (FRO) and First Responder – Awareness level (FRA), FRO – Weapons of Mass Destruction, and WMD Incident Commander. He earned his Bachelor of Science degree in environmental and occupational health science at California State University Northridge.

*Hazardous Waste Operations and Emergency Response

Departures

Bill Castle, Supervising Chemist



Senior Environmental Scientist Bill Castle has retired after 36 years of work for the Department of Fish and Game. He was instrumental in the planning, design, and configuration of OSPR's Petroleum Chemistry Laboratory (PCL) and ran it since it opened in 1991. Bill and his staff set the standard for analyzing fugitive oil and dispersant compounds and their metabolites in water, sediment, vegetation, and biological tissues by state-of-the-art instrument analytical techniques.

Starting as a seasonal aid with the DFG Pesticides Unit in 1967, Castle worked his way up in the Water Pollution Control Lab, where his first assignment was to analyze samples from the *SS Hawaiian* oil spill. At the WPCL he analyzed samples for trace elements, oil and hydrocarbons, water quality parameters, tannins and

See Inside OSPR, page 26

Inside OSPR, from page 25

lignins, and many other pollutants. He also trained wardens in the methods of collection, preservation, and transportation of samples for spill investigations that would stand up to legal challenges.

Bill's work on lead in duck wing bones lead DFG to prohibit the use of lead shot for waterfowl hunting. This has since become a national policy. In 1985, he started the Petroleum Identification Project — a precursor to the OSPR Program.

Castle worked in a cooperative study with the Western States Petroleum Association to develop a database of chemical characteristics of tarballs, seep oils, produced oils, and transported oils, to identify unknown source "mystery spills." He was one of the best at identifying the sources of spilled petroleum products, using investigative materials that could hold up in court. He did chemical detective work on such well-known oil spills as the *SS Jacob Luckenbach*/San Mateo, *MV Stuyvesant*/Humboldt, Torch/Platform Irene, Unocal/Guadalupe, and the infamous 1998 *MV Command* case — an illegal discharge off San Mateo County.

Bill has authored or co-authored 12 scientific papers. His contributions to pollution investigation helped make OSPR a model for others.

Jim Hardwick, Environmental Scientist

After over 38 adventurous years with the Department – 26 as a marine biologist and 12 at OSPR – Environmental Scientist Jim Hardwick is now enjoying his well deserved retirement!

Among his accomplishments for OSPR, Jim developed the layout and design of the sensitive site and response strategy pages for California's area contingency plans. He also implemented the Site Information and Site-Specific Response Strategy (SISSRS) survey for coordinating the development of response strategies with potential responsible parties, spill response organizations, and others interested in protecting environmental and cultural resources. He developed a system to identify the shoreline protection resources needed in any spill scenario, and a system to determine whether those resources are available and under contract by potential responsible parties.

Hardwick's dedication to the protection and beneficial management of wildlife and habitat sets an example for younger scientists to emulate. Fortunately for us, he will return as a retired annuitant to work on various OSPR projects and will be available for spill response. So, it's not truly "goodbye" to Jim – he just has more time for kayaking, these days!

Ted Martin, Oil Spill Prevention Specialist

Ted Martin has retired after eleven years as lead OSPS in the Northern California Field Office. During that time, he pioneered procedures for vessel monitoring and inspections and oil spill investigative and quantification techniques. He has designed and executed OSPS proficiency training exercises that encompass the full range of required knowledge in both oil spill site characterization and sampling, and personal protective safety techniques. He also set personal safety standards for his OSPS and Field Response Team (FRT) peers.

Staff safety has always been a top priority for Ted, and his colleagues knew he was looking out for everyone on spill sites. In fact, there have been no reportable injuries at any of the spill responses in which he has participated. He has set a high standard for others to follow in his attention to detail, model work ethic, and both strategic thinking and action. Martin leaves big shoes to fill in OSPR's Northern FRT.

Rod Simon, Enforcement Captain

Captain Rodney Simon has retired from his 28-year career as a California Peace Officer, after spending the last 24 years conserving wildlife and habitat for the Dept. of Fish and Game. He was DFG's highest ranking law enforcement official of African-American ancestry, and he proudly represented the ecological interests of all Californians as the Department's statewide pollution coordinator for inland hazardous materials response.

Rod was active in the emergency response to the July 1991 metam sodium (herbicide) spill into the upper Sacramento River, caused by a train derailment near Dunsmuir. It was one of the largest toxic spills in California history.

Simon began his law enforcement career at the California Dept. of Corrections, after earning a Bachelor of Science in science and biology, then doing a stint in the Army. His first assignment at DFG was as a marine game warden at the Monterey Branch Office. He was promoted to Lieutenant in 1985 and assigned to marine enforcement in the Long Beach area. It was from the Long Beach Office that Rod received another promotion, to the rank of Patrol Captain. Subsequent to this promotion, he was selected to participate in the Resources Agency Management Program for two years, training at DFG's Sacramento Headquarters. A knowledgeable and congenial officer who worked with OSPR through the division's first thirteen years, Rod (and his wife's salsa) are sorely missed!

Bill Weber, Oil Spill Prevention Specialist

Bill Weber has resigned from State service to become Hudson Marine Management Service's West Coast Response Manager. He had worked in OSPR's Marine Safety Branch since 2001. He was assigned to the Drills and Exercises Unit, which later became the Readiness Unit. There, he ran the OSRO rating program, reviewed oil spill contingency plans, and assisted in all unit projects. Bill can be reached by email at bill.weber@hmms-usa.com.

Significant Spills Since OSPR's Inception

Date	Location	Source	Product	Estimated *Barrels
4/17/04	Suisun Marsh	Kinder Morgan pipeline	diesel fuel	2,452
11/24/01	Bolinas to Carmel	SS Jacob Luckenbach	bunker fuel	unknown
12/30/00	E. Walker River	tank truck accident	#6 fuel oil	86
2/28/00	Ventura County	tank truck accident	crude oil	143
9/6/99	Eureka	M/V Stuyvesant	bunker fuel	48
11/10/98	Port of Long Beach	M/T Neapolis	crude oil	150
9/26/98	Half Moon Bay	M/V Command	bunker fuel	72
2/14/98	Ventura	Texaco pipeline	crude oil	200
1/24/98	Bardsdale	Torch pipeline	crude oil	500
11/5/97	Eureka	M/V Kure	bunker fuel	108
3/1/97	Donner Summit	SFPP pipeline	gas, diesel, jet	unknown
2/26/97	Norden	UPRR transfer pipe	red diesel	405
10/28/96	San Francisco	Cape Mohican	bunker fuel	200
3/11/95	Arroyo Passejero	Chevron pipeline	crude oil	6,000
12/94	San Diego River	fuel transfer line	jet aviation fuel	1,000
10/94	Guadalupe Bch.	Unocal pipelines	diluent	120,000-476,000
1/27/94	Martinez	Shell pipeline	diesel fuel	1,200
1/94	Santa Clara River	ARCO pipeline	crude oil	4,607
12/25/93	McGrath Lake	Berry Petroleum pipeline	crude oil	2,000
4/93	Grapevine Creek	ARCO pipeline	crude oil	6,200
1992	Avila Beach	Unocal tank Farm	crude oil	2,100
3/91	El Segundo	Chevron pipeline	crude oil	238
1/31/01	Santa Clara River	Mobil pipeline	crude oil	1,000
1/8/91	Los Angeles Harbor	M/V Sammi Superstar	bunker fuel	308

***One barrel equals 42 gallons.**

Alternate communication format is available upon request. If reasonable accommodation is needed call Mr. Robert Hughes at 916-445-9338, or the California Relay (Telephone) Service for the deaf or hearing-impaired from TDD phones at 800-735-2929.

Office of Spill Prevention and Response
California Dept. of Fish and Game
P.O. Box 944209
Sacramento, CA 94244-2090
www.dfg.ca.gov/ospr